AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application. Please amend the Claims as follows:

1. (Original) A particle for removing a contaminant from a fluid, comprising:

a substrate having an ion exchange capacity of at least about 50 mEq/100g and a plurality of ion exchange sites, wherein the plurality of ion exchange sites comprise a first set of sites that are pH independent and a second set of sites that are pH dependent; and

polyvalent metal sulfides located at each of the plurality of ion exchange sites.

2. (Original) The particle of Claim 1, wherein the polyvalent metal sulfides comprise copper sulfide.

3. (Previously Presented) The particle of Claim 1, wherein the substrate is a silicate and the first and second sets of sites are discontinuous.

4. (Previously Presented) The particle of Claim 3, wherein the silicate is a phyllosilicate.

5. (Previously Presented) The particle of Claim 3, wherein the silicate is a zeolite.

6. (Previously Presented) The particle of Claim 3, wherein the silicate is at least one of vermiculite and montmorillonite.

7. (Original) The particle of Claim 3, wherein the ion exchange capacity ranges from about 50 to about 150 mEq/100g.

8. (Original) The particle of Claim 1, wherein the polyvalent metal sulfides comprise a compound of copper and sulfur.

9. (Original) The particle of Claim 1, wherein the pH dependent ion exchange sites are located on exposed surfaces of plates forming the substrate.

10. (Original) The particle of Claim 1, wherein the fluid is a liquid and the substrate is adhered to a carrier substrate different from the substrate.

11. (Original) The particle of Claim 1, wherein the polyvalent metal is selected from the group consisting essentially of copper, nickel, chromium, cobalt, silver, cadmium and mixtures thereof.

12. (Original) The particle of Claim 1, wherein the polyvalent metal is copper.

13. (Original) The particle of Claim 1, wherein the fluid is a gas and further comprising mercury atoms sorbed onto the particle.

14. (Original) A process for treating a fluid comprising at least one ionic contaminant, comprising:

providing a contaminant removal agent, the agent comprising a polyvalent metal sulfide located at pH dependent ion exchange sites on a surface of a substrate; and

contacting the fluid with the agent to remove at least most of a mercury-containing contaminant from the fluid to form a treated fluid and a mercury-bearing agent.

15. (Original) The process of Claim 14, wherein the fluid is an aqueous liquid.

16. (Previously Presented) The process of Claim 14, wherein the contaminant removal agent comprises a substrate that is at least one of vermiculite, montmorillonite, and zeolite.

17. (Currently Amended) The process of Claim 14, wherein the ~~agent comprises a plurality of ion exchange sites, wherein plurality of ion exchange sites~~ agent further comprises a ~~first set~~plurality of ion exchange sites that are pH independent ~~and a second set of sites that are~~ in addition to the pH dependent ion exchange sites and wherein the polyvalent metal sulfide is located at ~~each of the ion exchange sites in the first and second sets~~both pH dependent and independent ion exchange sites.

18. (Previously Presented) The process of Claim 14, wherein the polyvalent metal is copper.

19. (Original) The process of Claim 14, wherein the metal sulfide is copper sulfide.

20. (Original) The process of Claim 14, wherein the polyvalent metal sulfide is a compound of copper and sulfur.

21. (Original) The process of Claim 14, wherein the agent substrate has a platelike structure and the pH dependent sites are located on edges of the plates.

22. (Original) The process of Claim 14, wherein the substrate has an ion exchange capacity ranging from about 50 to about 150 mEq/g.

23. (Original) The process of Claim 14, wherein the fluid is a liquid having a pH ranging from about pH 5 to about pH 9.

24. (Original) The process of Claim 14, wherein the substrate is a layered silicate.

25. (Original) The fluid stream treated by the process of Claim 14.

26. (Original) The mercury-bearing agent of Claim 14.

27. (Original) A method for manufacturing a contaminant removal agent, comprising:

(a) providing a substrate having a plurality of ion exchange sites; and

(b) contacting a solution comprising dissolved polyvalent metal ions with the substrate to form an ion exchanged substrate having polyvalent metal ions exchanged at the plurality of ion exchange sites, wherein the pH of the solution in the contacting step is greater than the pH_{ZPC} for the substrate.

28. (Original) The method of claim 27, further comprising:

(c) contacting the ion exchanged substrate with a sulfide-containing fluid to convert at least most of the polyvalent metal ions exchanged at the plurality of ion exchange sites into metal sulfides.

29. (Original) The method of Claim 27, wherein the polyvalent metal ions in step (b) are in the form of a tetraammine complex in the solution.

30. (Original) The method of Claim 27, wherein the substrate is at least one of vermiculite, montmorillonite, and zeolite.

31. (Original) The method of Claim 27, wherein the polyvalent metal is selected from the group consisting essentially of copper, nickel, chromium, cobalt, silver, cadmium and mixtures thereof.

32. (Original) The method of Claim 27, wherein the polyvalent metal is copper.

33. (Previously Presented) The method of Claim 28, wherein the metal sulfide is copper sulfide.

34. (Previously Presented) The method of Claim 28, wherein the metal sulfide is a compound of copper and sulfur.

35. (Original) The method of Claim 27, wherein the substrate has an ion exchange capacity ranging from about 50 to about 150 mEq/100g.

36. (Currently Amended) The method of Claim [[27]]28, wherein the ~~polyvalent~~ metal sulfides ~~is~~ are discontinuously distributed over the substrate.

37. (Original) The method of Claim 27, wherein a concentration of the dissolved polyvalent metal in the solution is at least about 2 wt.%.

38. (Original) The method of Claim 27, wherein the plurality of ion exchange sites comprise pH dependent and pH independent ion exchange sites and wherein the polyvalent metal is located at each of the plurality of sites.

39. (Original) The method of Claim 27, wherein in the contacting step the dissolved polyvalent metal ions are compounded with ammonia.

40. (Original) The method of Claim 39, wherein the concentration of the polyvalent metal ions in the solution is at least about 1 wt.%.

41. (Original) The method of Claim 39, wherein the pH of the solution is at least about pH 9.

42. (Original) The method of Claim 28, wherein, in step (c), the sulfide-containing fluid is a liquid having a pH ranging from about pH 8 to about pH 12.

43. (Previously Presented) The method of Claim 28, wherein the sulfide ion concentration in the sulfide-containing fluid ranges from about 2 to about 20 wt.%.

44. (Original) A system for purifying a mercury-containing fluid, comprising:

a device operable to contact the fluid with a contaminant removal agent, the agent comprising a substrate having an ion exchange capacity of at least about 50 mEq/100g and a plurality of ion exchange sites, wherein the plurality of ion exchange sites comprise pH dependent sites and pH independent sites, and wherein polyvalent metal sulfides are located at each of the plurality of ion exchange sites;

an input into the vessel for the fluid; and

an output from the vessel for a treated fluid.

45. (Original) The system of Claim 44, wherein the metal sulfides comprise copper sulfide.

46. (Original) The system of Claim 44, wherein the substrate is a silicate.

47. (Original) The system of Claim 44, wherein the substrate is a phyllosilicate.

48. (Original) The system of Claim 44, wherein the substrate is a zeolite.

49. (Original) The system of Claim 44, wherein the substrate is at least one of vermiculite and montmorillonite.

50. (Original) The system of Claim 44, wherein the ion exchange capacity ranges from about 50 to about 150 mEq/100g.

51. (Original) The system of Claim 44, wherein the polyvalent metal sulfide is a compound of copper and sulfur.

52. (Original) The system of Claim 44, wherein the polyvalent metal is selected from the group consisting of copper, nickel, chromium, cobalt, silver, cadmium, and mixtures thereof.

53. (Original) The system of Claim 44, wherein the fluid is a gas comprising mercury.

54. (Original) The system of Claim 44, wherein the fluid is a liquid comprising dissolved mercury.

55. (Original) The system of Claim 53, wherein the mercury is in speciated and elemental form.

56. (Original) The system of Claim 54, wherein the mercury is in speciated and elemental form.

57. (Currently Amended) An intermediate product in the manufacture of a particle for removing a contaminant from a fluid, comprising:

a substrate having an ion exchange capacity of at least about 50 mEq/100 g and a plurality of ion exchange sites; and

polyvalent metal and ammonia complexes at each of the plurality of ion exchange sites.

58. (Original) The intermediate product of Claim 57, wherein the polyvalent metal and ammonia complexes comprise polyvalent metal ammonium complexes.

59. (Original) The intermediate product of Claim 57, wherein the polyvalent metal and ammonia complexes comprise polyvalent metal ammine complexes.

60. (Original) The intermediate product of Claim 57, wherein the polyvalent metal and ammonia complexes comprise cuprammine.

61. (Original) The intermediate product of Claim 57, wherein the plurality of ion exchange sites comprise a first set of sites that are pH independent and a second set of sites

that are pH dependent, and wherein the polyvalent metal and ammonia complexes are located at each of the first and second set of sites.

62. (Original) The intermediate product of Claim 57, wherein the substrate is a silicate.

63. (Original) The intermediate product of Claim 57, wherein the substrate is a phyllosilicate.

64. (Original) The intermediate product of Claim 57, wherein the substrate is a zeolite.

65. (Original) The intermediate product of Claim 57, wherein the substrate is at least one of vermiculite and montmorillonite.

66. (Original) The intermediate product of Claim 57, wherein the ion exchange capacity ranges from about 50 to about 150 mEq/100 g.

67. (Original) The intermediate product of Claim 61, wherein the pH dependent ion exchange sites are located on exposed surfaces of plates forming the substrate.

68. (Original) The intermediate product of Claim 57, wherein the polyvalent metal is selected from the group consisting essentially of copper, nickel, chromium, cobalt, silver, cadmium and mixtures thereof.

69. (Original) The intermediate product of claim 57, wherein the polyvalent metal is copper.